

WHAT IS CLAIMED IS:

1 1. A parts mounting and assembling apparatus comprising:
2 a base unit including:
3 a body containing a device to be used in common
4 among a plurality of processes for mounting and assembling
5 parts;
6 a conveying mechanism for conveying a workpiece,
7 which is an object of mounting and assembling, on said
8 body in a predetermined conveying direction along a
9 manufacturing line; and
10 a positioning mechanism for placing said
11 workpiece at a predetermined position in said predetermined
12 conveying direction;
13 a dedicated unit including an end effector for
14 conducting processing on said workpiece or a part to be
15 mounted on said workpiece, according to each of said
16 processes; and
17 a selected mechanism unit including a moving mechanism
18 for moving said end effector in two axial directions
19 perpendicular to said predetermined conveying direction
20 in each of said processes to adjust a relative position
21 between said end effector and said workpiece or said part
22 for positioning,
23 said moving mechanism being selected from a plurality
24 of types according to the contents of each of said processes
25 to be interchangeably attached as said selected mechanism
26 unit with respect to said base unit, and

27 said end effector being selected from a plurality of
28 types according to the contents of each of said processes
29 to be interchangeably attached as said dedicated unit with
30 respect to said moving mechanism.

1 2. A parts mounting and assembling apparatus according
2 to claim 1, wherein said selected mechanism unit further
3 includes an aligner mechanism for adjusting a horizontal
4 position of said workpiece or part to be introduced into
5 said manufacturing line by said end effector or adjusting
6 a horizontal position of said workpiece taken out from
7 said manufacturing line by said end effector, with said
8 aligner mechanism being selected from a plurality of types
9 according to the contents of each of said processes to
10 be interchangeably attached as said selected mechanism
11 unit with respect to said base unit, and

12 said dedicated unit further includes a fixing
13 mechanism for fixing said workpiece or said part at a
14 predetermined position on said aligner mechanism, with
15 said fixing mechanism being selected from a plurality of
16 types according to the contents of each of said processes
17 to be interchangeably attached as said dedicated unit with
18 respect to said aligner mechanism.

1 3. A parts mounting and assembling apparatus according
2 to claim 1, wherein said parts mounting and assembling
3 apparatus is made to be connectable to parts mounting and

4 assembling apparatuses for other processes in said
5 predetermined conveying direction and, at the connection
6 with the other-process parts mounting and assembling
7 apparatuses, said conveying mechanism is made to deliver
8 said workpiece to a conveying mechanism of the
9 other-process parts mounting and assembling apparatus
10 adjacent to said parts mounting and assembling apparatus.

1 4. A parts mounting and assembling apparatus according
2 to claim 2, wherein said parts mounting and assembling
3 apparatus is made to be connectable to parts mounting and
4 assembling apparatuses for other processes in said
5 predetermined conveying direction and, at the connection
6 with the other-process parts mounting and assembling
7 apparatuses, said conveying mechanism is made to deliver
8 said workpiece to a conveying mechanism of the
9 other-process parts mounting and assembling apparatus
10 adjacent to said parts mounting and assembling apparatus.

1 5. A parts mounting and assembling apparatus according
2 to claim 3, wherein, as said conveying mechanism, two
3 conveying mechanisms are disposed in parallel with each
4 other in the form of two lines on said base unit, one
5 conveying mechanism is made to convey a pallet, on which
6 said workpiece is placed, to said other-process parts
7 mounting and assembling apparatus adjacent thereto in said
8 predetermined conveying direction, and the other conveying

9 mechanism is made to convey only said pallet to said
10 other-process parts mounting and assembling apparatus
11 adjacent thereto in a direction opposite to said
12 predetermined conveying direction.

1 6. A parts mounting and assembling apparatus according
2 to claim 4, wherein, as said conveying mechanism, two
3 conveying mechanisms are disposed in parallel with each
4 other in the form of two lines on said base unit, one
5 conveying mechanism is made to convey a pallet, on which
6 said workpiece is placed, to said other-process parts
7 mounting and assembling apparatus adjacent thereto in said
8 predetermined conveying direction, and the other conveying
9 mechanism is made to convey only said pallet to said
10 other-process parts mounting and assembling apparatus
11 adjacent thereto in a direction opposite to said
12 predetermined conveying direction.

1 7. A parts mounting and assembling apparatus according
2 to claim 1, wherein said body of said base unit contains,
3 as said device, a control unit for controlling operations
4 of said conveying mechanism, said positioning mechanism,
5 said moving mechanism and said end effector.

1 8. A parts mounting and assembling apparatus according
2 to claim 1, wherein said body of said base unit
3 contains, as said device, an input/output unit functioning

4 as an input/output interface for interchanging a signal
5 with respect to an external controller or a control unit
6 of a parts mounting and assembling apparatus for other
7 process.

1 9. A parts mounting and assembling apparatus according
2 to claim 1, wherein said body of said base unit is
3 constructed by disposing a fundamental frame having an
4 H-shaped cross section along an axis of said body.

1 10. A parts mounting and assembling apparatus according
2 to claim 9, wherein said fundamental frame constituting
3 said body of said base unit is made to be connectable to
4 a frame extension having an H-shaped cross section for
5 extending said base unit.

1 11. A parts mounting and assembling apparatus according
2 to claim 9, wherein said fundamental frame of said base
3 unit is arranged and fixed on a ladder-type line chassis.

1 12. A parts mounting and assembling apparatus according
2 to claim 10, wherein said fundamental frame of said base
3 unit is arranged and fixed on a ladder-type line chassis,
4 and said frame extension of said base unit is arranged
5 and fixed on a chassis extension connected to said
6 ladder-type line chassis.

1 13. A parts mounting and assembling apparatus according
2 to claim 11, wherein a dovetail groove is made in said
3 ladder-type line chassis, a movable nut is placed in said
4 dovetail groove to slide along said dovetail groove, and
5 said fundamental frame is fixed onto said ladder-type line
6 chassis through the use of said movable nut.

1 14. A parts mounting and assembling apparatus according
2 to claim 12, wherein dovetail grooves are made in said
3 ladder-type line chassis and said chassis extension,
4 movable nuts are placed in said dovetail grooves to slide
5 along said dovetail grooves, and said fundamental frame
6 and said frame extension are fixed onto said ladder-type
7 line chassis and said chassis extension through the use
8 of said movable nuts, respectively.

1 15. A parts mounting and assembling apparatus according
2 to claim 11, wherein said fundamental frame of said base
3 unit is arranged through a movable guide onto said
4 ladder-type line chassis, and said base unit, together
5 with said selected mechanism unit and said dedicated unit,
6 is made to be drawn out in a horizontal direction
7 perpendicular to said predetermined conveying direction
8 from said ladder-type line chassis.

1 16. A parts mounting and assembling apparatus according
2 to claim 12, wherein said fundamental frame and said frame

3 extension of said base unit are arranged through movable
4 guides onto said ladder-type line chassis and said chassis
5 extension, respectively, and said base unit, together with
6 said selected mechanism unit and said dedicated unit, is
7 made to be drawn out in a horizontal direction perpendicular
8 to said predetermined conveying direction from said
9 ladder-type line chassis and said chassis extension.

1 17. A parts mounting and assembling apparatus according
2 to claim 1, wherein said conveying mechanism and said
3 positioning mechanism in said base unit are integrated
4 with each other.

1 18. A parts mounting and assembling apparatus according
2 to claim 17, wherein said conveying mechanism and said
3 positioning mechanism comprise an elevating/lowering
4 mechanism for moving a pallet, on which said workpiece
5 is placed, upwardly and downwardly and a pitch feed
6 mechanism for moving said elevating/lowering mechanism
7 together with said pallet in said predetermined conveying
8 direction for positioning.

1 19. A parts mounting and assembling apparatus according
2 to claim 18, further comprising a parts supply unit for
3 moving a table, on which a parts supply tray is arranged,
4 in said predetermined conveying direction or a direction
5 opposite to said predetermined conveying direction, by

6 diverting components of said elevating/lowering mechanism
7 and said pitch feed mechanism functioning as said conveying
8 mechanism and said positioning mechanism in said base unit.